AI-Based Stock Prediction, Analysis, and Chatbot Platform

Overview

This project integrates **deep learning**, **agentic AI**, and **generative AI** to build a smart, web-based stock analysis and trading assistant. It empowers users with:

- Accurate future stock predictions
- Real-time news and market updates
- · AI chatbot for instant user support
- Buy/Sell functionality with intuitive charts

Technologies used include **FastAPI**, **React.js**, **LangChain**, **Groq API**, **YFinance**, and advanced ML models (LSTM, GRU, etc.).

Architecture

Frontend

- **React.js** with Chart.js for data visualization
- Material-UI/Bootstrap for UI components

Backend

- **FastAPI** (REST API) to handle:
 - Stock predictions
 - Chatbot interaction
 - Real-time market data
 - User trading requests

AI Integration

- Deep Learning Models (LSTM, GRU, Transformer)
- Agentic AI using Phi Framework + Groq
- LangChain with Groq/Gemini/Ollama for chatbot

Technologies & Components

1. Stock Price Prediction (Deep Learning)

Models Used:

- LSTM: Good for sequential trends
- GRU: Lighter alternative to LSTM
- Transformer: Excellent for long sequences and faster training
- Recommended: Informer or Temporal Fusion Transformer (TFT) for advanced time-series forecasting

Libraries:

TensorFlow, Keras, PyTorch, scikit-learn, pandas, numpy

2. 3 Agentic AI for Market & News Updates

Stack Used:

- **Groq API**: Ultra-fast LLM for real-time responses
- YFinanceTools: Pulls latest stock market data
- **DuckDuckGo**: Gathers global news & sentiments

Output: Aggregated stock analysis and latest news

Tools Used:

- LangChain with support for:
 - Groq (blazing-fast inference)
 - Gemini (Google's multi-modal LLM)
 - Ollama (run local LLMs)

Recommendation:

Use **LangChain + Groq** for production due to speed. Add Gemini for multi-modal or web data responses.

💼 Features

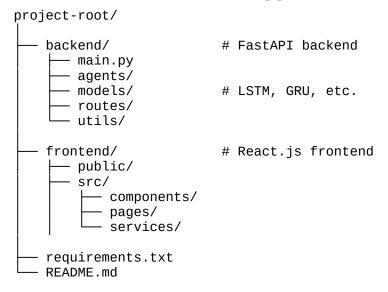
- Stock Predictions (using deep learning)
- **News Updates** (agent-based via DuckDuckGo)
- Customer Chatbot (LangChain + Groq)
- **& Buy/Sell Stocks** (basic simulated trading API)



🚀 Bonus/Advanced Ideas

- Sentiment Analysis from tweets/news headlines using HuggingFace DistilBERT
- **Auto Portfolio Rebalancing** using RL
- Voice Assistant Integration with Web Speech API
- **User Authentication** (OAuth2, JWT tokens)
- **User Trading Analytics Dashboard**
- **TradingView API** or **Alpaca API** integration for real-time trades

Folder Structure (Suggestion)



Resources

- Groq API
- Phi Agents GitHub
- LangChain Docs
- **YFinance**
- TradingView Widgets